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ON THE MAMMALIA OF NORTH GREENLAND AND GRINNELL LAND.

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On the 29th July, 1875, the Arctic Expedition,—H.M. Ships 'Alert' and 'Discovery,'—under the command of Captain G. S. Nares, R.N., passed from the north-water of Baffin Bay into the ice of Smith Sound. On the 1st September, 1875, the 'Alert' reached the limit of navigation, in latitude 82° 27′ N., on the northern shore of Grinnell Land, the 'Discovery' having previously found winter-quarters in a commodious harbour on the western side of Robeson Channel, in 81° 44′ N. lat. In the following year, 1876, sledging expeditions were pushed out due north over the frozen sea, and also along the coast lines east and west, whilst subsidiary sledging expeditions examined various portions of coast line and penetrated, where possible, into the interior. All the officers employed in these expeditions took a lively interest in the zoological results of the voyage, and I am indebted to one and all for their ready assistance. A large extent of country was carefully worked, and I am quite confident that no species of mammal escaped our united observations. In the end of July, 1876, after an imprisonment of eleven months, the 'Alert' broke out of winter-quarters, and again rounding Cape Union joined her consort at Discovery Bay. Together the two vessels made the perilous passage down Smith Sound, and on the 10th September reached the north-water, and comparative safety, of Baffin Bay.

Homo grœnlandus.—The most northern known inhabitants of our globe are the Eskimo that dwell along the coasts of North Greenland between Cape York, the northern extremity of Melville Bay, and the great Humboldt glacier, which discharges into Smith Sound on its eastern side, between the seventy-ninth and eightieth parallels of north latitude. These *εσχατοι ανδρων* were first brought to notice by Captain Sir John Ross, who discovered them during his voyage to Baffin Bay in 1818, and they were called by him the "Arctic Highlanders." Since then Dr. Kane, Dr. Hayes and Dr. Bessels, with their different Expeditions, wintered in the vicinity of these people, and have published graphic and interesting accounts of their habits and ways of life. The most northern settlement of these Eskimo at the present day is Etah, on the northern shore of Foulke Fiord, from whence the hunters of the tribe travel along the Greenland coast as far north as the southern edge of the Humboldt glacier, a little beyond the seventy-ninth degree. That they also at times cross the Sound and visit the opposite shores is evident from Dr. Bessels having reached latitude 79° 16′, on the east coast of Grinnell Land, by sledging, in company with two of the Etah Eskimo, on April 16th, 1873.* In 1875, I found at Cape Sabine the remains of several ancient Eskimo encampments, but nearer to the shore traces of a recent visit, a blackened fire-place made of three stones placed against a rock, with the hairs of a white bear sticking to the grease-spots, an harpoon with iron tip, and the *excreta* of the dogs who had fed off the bear's hide. Further north, on the shores of Buchanan Strait, we came upon deserted settlements containing the ruins of many "igloos"; in one instance the ribs of a large cetacean had been used as rafters to a hut; bones of Reindeer, Musk-ox, White Bear, Seal and Walrus were strewed around, and I picked up several articles of human workmanship, both in bone and ivory. Still further north, Norman Lockyer Island, in Franklin Pierce Bay, at some distant period, must have been the home of numerous Eskimo. On the 11th August, 1875, I landed and walked along the northern shore of this island for some two miles; it was strewed with the bones of walrus, whilst skulls of this animal were lying about in hundreds, all broken more or less by human agency, in every instance the tusks having been extracted. Skulls of *Phoca barbata* and *P. hispida*, broken at the base in order to extract the brain, were numerous, and I came across fragments of the skeleton of one cetacean. Patches of green moss marked the sites of ancient habitations, and circles of stones summer tents, whilst numerous stone "caches" and cooking-places, now overgrown with moss and lichen, but containing calcined bones, bore silent witness to the former presence of inhabitants. At various points of Grinnell Land, still further north, notably at Cape Hilgard, Cape Louis Napoleon, Cape Hayes and Cape Fraser, I came across old traces of Eskimo. At Radmore Harbour, in 80° 25′ N. lat., I found the ruins of another large settlement, apparently as long deserted as the one on Norman Lockyer Island. After removing the green moss and overturning some of the large stones that had once formed the walls of the "igloos," I discovered several interesting ivory relics. On Bellot Island, at the entrance of Discovery Bay, 81° 44′ N. lat., were several rings of lichen-covered stones that marked the sites of old encampments, fragments of bone and chips of drift-wood being strewn around. A few miles south of Cape Beechey I found more circles of tent-stones; and near at hand a small heap of rock-crystals and flakes showed where the artificers in stone had been making arrow or harpoon heads. Close under Cape Beechey, and about six or seven miles from the eighty-second parallel, I came across the most northern traces of man that have yet been found; they consisted of the frame-work of a large wooden sledge, a stone lamp in good preservation, and a very perfect snow-scraper made out of a walrus-tusk. Taking into consideration that where I found these relics is at the narrowest part of Robeson Channel, not more than thirteen miles across, and that a few miles to the south, near Cape Lupton, on the opposite shore of Hall Land, the 'Polaris' Expedition found traces of summer encampments, I am inclined to believe that this must have been the spot selected for crossing over the channel, and, owing probably to the difficult and dangerous nature of the ice to be encountered, the heavy sledge and *impedimenta* had been left behind. It may perhaps have marked the *ultima thule* of human advance, and of a cruel destiny that forced poor beings to render up their lives at the altar of discovery, under the light of the midnight sun. This thought crossed my mind as I came across these relics, and human imagination can scarcely depict a spot more wild or more weird than that I then gazed on, or one more befitting the enactment of such a tragedy. Northwards from this point no trace of man was discovered by any of our parties, neither westward along the northern shores of Grinnell Land, or eastward along the coasts of Greenland that border the Polar Basin. I am quite convinced that the men whose tracks we followed as far as the eighty-second degree never got round Cape Union. Even in the short summer of July and part of August animal life is too scarce there to support a party of travelling Eskimo, whilst the idea of winter residence is beyond consideration. In my opinion it is impossible for any Eskimo to have rounded the northern shores of the Greenland continent, and the presence of the tribe seen by Sabine and Clavering on the eastern coast of Greenland may easily be accounted for by their having rounded Cape Farewell from the westward. It is well known that formerly considerable numbers of Eskimo were living to the eastward of Cape Farewell, but year by year stragglers and small parties from these outside savages have re-entered the Danish colonies to the westward of Cape Farewell, and become absorbed amongst the civilized Greenlanders. This slow but steady return to the southward fully accounts for the German Polar Expedition of 1869-70 not meeting with the Eskimo tribe seen by Sabine on the east coast. The result of my observations amounts to this, that along the shores of Smith Sound, Kennedy Channel, Hall Basin and Robeson Channel, three degrees north of the present extreme range of the Etah Eskimo, the most northern race of men known, there are to be found not only traces of Eskimo wanderings, but many proofs of former permanent habitation in places where under present climatic conditions it would be impossible for even the "Arctic Highlanders" now to exist.

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* Report Sec. U.S. Navy, 1873, p. 537.

Ursus maritimus.—There is little to tempt this animal from the comparatively rich hunting-fields of the north-water of Baffin Bay to the dreary shores of Smith Sound and northward. A single Bear was killed by Dr. Bessels, of the 'Polaris' Expedition, in Petermann Fiord, and foot-marks were observed by members of our Expedition near Thank God Harbour; and along the coast of Grinnell Land between the winter quarters of the 'Alert' and 'Discovery,' we also saw foot-marks in the neighbourhood of Cape Hayes. At the present day I do not imagine the White Bear ever enters the Polar Basin through Robeson Channel. The cranium of a very large example was found by Captain Markham on the northern shores of Grinnell Land in latitude 82° 30′ N., some distance from present high-water level. I think it is not improbable that this specimen may have been washed out of the mud-beds which fill up the valleys of that region to an altitude of several hundred feet, and from which I have taken the remains of Seal, Musk Ox and other animals, with abundance of drift-wood and the shells of most of the Mollusca now inhabiting the adjacent sea. If I am right in this surmise, there is no saying from what distance or from what direction this cranium may have been brought on an ice-raft.

Mustela erminea.—The Ermine has followed the Lemming, *Myodes torquatus*, throughout its northern migrations to the shores of the Polar Basin, and crossing Robeson Channel in company with this little rodent has invaded North Greenland, where Lieutenant Beaumont, R.N., secured an example during his sledge journey in latitude 82° 15′ N. It doubtless extends as far south on the eastern shore of Greenland, where it was found by the Germans, as the range of the Lemming. I obtained specimens in Grinnell Land as far north as 82° 30′, and several examples were shot near Discovery Bay. It is hunted and killed by the Arctic Fox. We noticed the tracks of this little animal in the snow on the reappearance of sun-light, and remarked that it is infested by a tenia.

Canis lupus.—This animal was not met with by Dr. Bessels in Hall Land, and consequently I hardly expected to meet with it still further north in Grinnell Land. However, on the 1st April, 1876, several Wolves made their appearance in the neighbourhood of the winter quarters of the 'Alert.' They were evidently following a small herd of Musk-ox, whose tracks and traces were observed in the vicinity. That the Wolves are able at times to secure these animals was shown by their droppings being composed chiefly of Musk-ox wool and splinters of bone. Several of our sportsmen started in pursuit of these Wolves, but with one exception they did not allow any one to approach them within three or four hundred yards. The exceptional Wolf followed Captain Markham, who was unarmed, for more than two miles, no doubt attracted by the retriever bitch that accompanied that officer. These Wolves were larger than the largest of our Eskimo dogs, and of a light gray colour, with long fur and drooping tail. They agreed well with the description by Richardson of *Canis lupus-occidentalis.* The following day, April 2nd, the Wolves still continued in the neighbourhood of the ship, and at intervals their long, melancholy, but not unmusical wail reverberated from the hills. After this date we saw no more of these animals till the 25th May, when a single individual followed the sledge I was with for several days as we travelled along the coast. It was a most cunning beast, and eluded all our endeavours to get a shot at it. Subsequently I procured a cranium and part of the skeleton of one of these animals, which was picked up by a sailor of the ship. This animal is infested by a species of tenia.

Vulpes lagopus.—The Arctic Fox decreases in numbers as we proceed up Smith Sound. One was shot on the ice near Victoria Head, Grinnell Land, which was prowling around the ship, and more than one specimen was obtained near the winter-quarters of the 'Discovery.' At Floe-berg Beach, the winter-quarters of the 'Alert,' foot-prints of the Fox were occasionally seen in the snow, but it was not till the 13th July, 1876, that I obtained a specimen in the flesh. On that occasion Lieutenant Parr, R.N., and I were out on a hunting expedition, our tent being pitched at Dumbell Harbour, some miles north of Floe-berg Beach, and from it we made daily incursions up the valleys leading to the uplands in hopes of meeting with big game. On the date above mentioned we had ascended to an altitude of eight hundred feet above the sea, and had emerged on a great plateau which stretched for several miles towards a range of mountains. The snow had melted from more than one-half of its area, the surface being composed of splintered slates, which rendered walking very disagreeable and very severe on shoe-leather. A few Knots, *Tringa canutus*, rose wild from pools of snow-water, and tempted us to continue our journey along this dreary upland, in hopes of finding a nesting pair. Soon heavy snow began to fall, and the mist came tearing down from the mountains enveloping us. We steered then by compass, but occasionally the sun and wind dispersed the mist and gave us good sights of the mountains, by which we corrected our bearings. All of a sudden we were startled by the sharp bark of a Fox. More than a year had elapsed since we had heard such a sound. It seemed very close to us, and as the fog lifted we saw the animal standing on a little hill of piled-up rocks that rose like an islet from the plateau. Separating we approached the Fox from opposite directions. Parr fired at it, when it dropped down and crawled below some heavy rocks: out rushed the female from its lair, and we secured her. These animals in summer garb are very different to the snow-white skins which we usually associate with Arctic Foxes. The hair on the back and brush is of a dirty rufous tinge, on the belly yellowish white. The flora in the neighbourhood of this den was wonderfully rich, the soil having been fertilized by the presence of the Foxes. Several Saxifrages, a *Stellaria*, a *Draba* or two, and two or three kinds of grass were in bloom, and the yellow blossom of the *Potentilla* brightened the spot. As we rested there, many little Lemmings popped up from their holes, and undismayed by our presence commenced feeding on the plants. We noticed that many dead Lemmings were scattered around. In every case they had been killed in the same manner, the sharp canine teeth of the Foxes had penetrated the brain. Presently we came upon two Ermines killed in the same manner: these were joyful prizes, for up to this time we had not obtained these animals in northern Grinnell Land. Then to our surprise we discovered numerous deposits of dead Lemmings. In one out-of-the-way corner under a rock we pulled out a heap of over fifty dead Lemmings. We disturbed numerous "caches" of twenty and thirty, and the ground was honeycombed with holes that each contained several bodies of these little animals, a small quantity of earth being placed over them. In one hole we found the major part of a Hare carefully hidden away. The wings of young Brent Geese, *Bernicla brenta*, were also lying about; and as these birds were at that date only just hatching, it showed that they must have been the results of successful forays of prior seasons, and that consequently the Foxes occupy the same abodes from year to year. I had long wondered how the Arctic Fox existed during the winter. Prof. Newton had already suggested, in his 'Notes on the Zoology of Spitzbergen,' that the Fox probably made some provision for winter sustenance, and I was much pleased by finding these large deposits of dead Lemmings and other animals, unquestionably bearing out the same views. It is also a very beautiful arrangement that the increased flora induced by the presence of the Foxes should be the means of attracting and sustaining the Lemmings in the immediate vicinity of the Foxes' den. The Arctic Fox, although I subsequently saw a second pair in the same neighbourhood, may be considered somewhat rare in the northern part of Grinnell Land. The specimens obtained did not differ in size from those killed further south.

Myodes torquatus.—This species of Lemming was found in great abundance along the western shores of Smith Sound, and was traced by our explorers to the eighty-third degree of north latitude and to the extreme western point attained. On the Greenland shore it was found at Thank God Harbour by members of our Expedition, where it had previously been obtained by Dr. Bessels, and traces of it were noticed by our sledge parties who travelled along the northern shores of Greenland. There can be no doubt that the eastern migration of this animal has been across Robeson Channel and around the north coast of Greenland to Scoresby Sound on the east coast, from which locality this animal was brought by Captain Scoresby in 1822. Apparently its southern range on the west coast of Greenland is stopped by the great Humboldt glacier. This Lemming is a great wanderer: we found it on the floes of Robeson Channel at considerable distances from land, sometimes in a very exhausted state, but generally dead. Its habit of leaving the shore and wandering over the ice fully accounts for the skeleton of one of this species being found on a floe in latitude 81° 45′ N., sixty miles from Spitzbergen, by Sir J. C. Ross during Parry's memorable attempt to reach the North Pole in 1827. The peculiar formation of the claws in this species is not permanent; that is to say, it is to a considerable extent seasonal. During the greater part of the year, when the ground is covered with snow, and the animal has to seek its food below the surface of the snow, the claws on the fore-feet attain a great development, and are used in burrowing through the snow. By the month of July, when large areas are bared of snow, and the Lemming, feeding on plants in the open, seeks shelter under rocks or by scratching holes in the earth, the lower portion of the nail on the fore-foot becomes obliterated, either being worn by contact against the hard earth or else gnawed off by the animal. The young have sharp-pointed claws on their fore-feet, and from an examination of a large series of adults of both sexes I find that the summer alteration in the shape of the claw is the same in both sexes. The month of March was the earliest date by which we had sufficient light to enable us to secure these animals, and at that season their coats were white on the outside, changing to slate-blue underneath. The food of this Lemming consists of vegetable substances, especially the buds of *Saxifraga oppositifolia*. It makes nests of grass in the snow, which we often found during summer as the snow thawed: in most cases large accumulations of the dung of these animals were lying close to the nests. I see no reason to suppose that this animal hybernates, for on the return of light, with a temperature at —50° and a deep mantle of snow covering the land, the Lemming was to be seen on the surface of the snow, close to its syphuncle, blinking at the bright rays of the sun, and during the depths of winter there could be no greater difficulty in procuring food than in March. Sometimes I came across the Lemming at some distance from the hole by which it retreats to its galleries under the snow, and it was interesting to see the rapidity with which it could disappear, throwing itself on its head, its fore-paws worked with great rapidity, rotating outwards, and throwing up a cloud of snow-dust some six inches high. Later on in the year I have seen a Lemming baffle the attempts at capture of a Long-tailed Skua, *Stercorarius longicaudatus*, by the same tactics. The female brings forth from three to five at a birth in June and July, making a comfortable nest of grass for their reception.

(To be continued.)

THE BIRDS OF THE MOY ESTUARY

AND THE SURROUNDING DISTRICT.*

By Robert Warren.

Order Natatores.

Wild Swans, *Cygnus ferus* or *Bewickii.*—Are often observed during winter on their passage to the mountain loughs of Erris, but only occasionally seen on the tidal parts of the Moy. I first met with them on the estuary during the severe winter of 1860; on the 28th December I observed three Swans, amongst a large flock of Wigeon, feeding on the *Zostera* along the Moyview shore. It being flood-tide they fed closer to the land as the water deepened, and as I watched them from behind a fence I remarked that they occasionally uttered a low sweet note. After some time the flowing tide brought them within range, and although I severely wounded two by the same shot, one having a broken wing, they unfortunately got away. My dogs, never having seen such large birds before, were afraid to follow them, and my boat lying under several feet of snow I was unable to launch her in time to secure them. On the 30th of the same month a flock of twenty were seen flying up the river, closely followed by five more. In January, 1867, I remarked a solitary bird on the river, and heard others calling as they passed overhead in a thick fog. On the 27th December, 1870, a large flock of between thirty and forty birds were seen resting in the channel near Scurmore; they remained until about three o'clock, when they all rose from the water and flew across the country in the direction of Lough Conn, and on the following morning about ten o'clock a flock of thirty, coming from the north-east, were seen flying in the same direction. On December 4th, 1871, I observed twenty birds in the estuary near Ballysokeery. I followed them in my punt, but was unable to get within range, owing to the wariness of the largest bird in the flock. This bird when he saw the boat began to call, and then, closely accompanied by two cygnets, swam off, followed by the others; but wherever he went the two cygnets kept quite close and never attempted to follow any others of the flock, the large bird very probably being the parent of the cygnets. I cannot feel certain whether the swans seen are the great Wild Swan or Bewick's, but from their call-note and size I am inclined to think them the latter species, the call-notes I have heard more resembling the words "awe, awe, awe" than the "whoo—whoo—whoop" of the Whooper.*

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* Concluded from p. 290.

Bean Goose, *Anser segetum.*—A regular winter visitant, but met with in much smaller numbers than the next species, which is the most numerous of all the inland-feeding geese in this district.

White-fronted Goose, *Anser albifrons.*—Very common in suitable localities. I have seen them as early as the 29th September and as late as the 25th April, and have been told of their remaining up to May 1st. All through the winter several flocks pass over this place twice daily to and from their feeding grounds. They generally rest by day on the wide expanse of flat bog lying at the foot of the Ox Mountains, County Sligo, and just before dusk cross over into the County Mayo to feed about Rarooyeen Lake and the swampy lands near Mullifarry. I have only twice seen them on the tidal part of the river; but the great haunt for geese is near Foxford on the wide expanse of meadows along the River Moy.

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* In Ireland Bewick's Swan is said to be much commoner than the Whooper, *c. f.* Thompson, 'Birds of Ireland,' vol. iii. p. 17.—Ed.

Bernicle Goose, *Anser bernicla.*—Very rare in this district. In October, 1867, a solitary bird for several days frequented the Moyview shore, but I was unsuccessful in obtaining it. It was afterwards shot by a neighbouring farmer. Captain Dover informed me that when punt-shooting at Drumcliffe, Sligo Bay, he occasionally fell in with small flocks of this species.

Brent Goose, *Anser brenta.*—Occasionally seen in the Bay and Estuary, but seldom remains longer than a day or two, for there are no beds of *Zostera* where they can feed by day undisturbed, the only beds being so close to the village of Ballysokeery that even the Wigeon scarcely ever feed on them except at dusk or during the night. The chief haunts of the Brent Geese on the Mayo coast is Blacksod Bay, near Bellmullet, where they may be seen in thousands throughout the winter.

Shelldrake, *Tadorna vulpanser.*—Has again become resident of late years. Since 1873 a pair have reared their young every season in the Bartragh rabbit-burrows, though previous to that date I only remember seeing them in winter. The cause of their return to the old breeding haunts may be attributed to the strict preservation of the warren by the owner, Captain Kirkwood, who since he has taken up his residence at Bartragh House has most carefully preserved the island from summer poachers.

Shoveller, *Anas clypeata.*—Very rare, and has only once come under my notice. On January 1st, 1862, I observed a fine adult male Shoveller amongst a flock of Wigeon on the river. In November, 1870, Capt. Dover, when punt-shooting near Bartragh, shot a beautiful pair, male and female, which he presented to the Royal Dublin Society's Museum.

Wild Duck, *Anas boschas.*—Very common in the district. A few small flocks are occasionally seen in the estuary, a hard night's frost always increasing their numbers, but the great body of them always keep on the lakes and inland waters, and when some of the large flocks come down from their inland haunts to the sea-coast they do not rest with the Wigeon in the estuary, but keep outside Bartragh in the open bay, and, if the weather is stormy, rest on the sands of that island facing the sea. On some mornings hundreds may be seen on their passage from the lakes to the sea, where they remain safe from molestation all day, and after dark they return in little detached parties to their inland feeding grounds. They breed in suitable localities throughout the district, and though an exceptionally early nest may be discovered, about the middle of May is the time I have found the greatest number of nests with the females sitting.

Gadwall, *Anas strepera.*—This rare duck I have only seen here twice. In the first instance, in the winter of 1855, I observed five birds feeding on the sands at low-water on the Sligo side of the estuary near Scurmore; and again, on the 6th March, 1856, I shot an adult pair (male and female) out of a flock of seven as they were feeding on the Moyview shore in company with some Wigeon. The patch of black on the tail-coverts of the male, and the peculiar carriage of their heads and bills, induced me to aim at them rather than at the Wigeon, of which latter I killed a pair also at the same shot.

Pintail, *Anas acuta.*—Visits the estuary every winter in limited numbers, associating with the Wigeon. Sometimes ten or twelve birds may be seen together, but the general number is seven or eight, probably a little family party.

Teal, *Querquedula crecca.*—Seldom seen in any numbers on the waters of the estuary, unless driven by severe frost from their inland haunts. Flocks of from fifty to a hundred birds may then be seen on the tidal parts of the river, where they remain while the frost lasts; but shortly after the thaw sets in they all return to their favourite feeding grounds by lake and bog. I have seen Teal on Rarooyeen Lake in summer, where they probably have nests amongst the reeds on the margin of the lough.

Wigeon, *Anas penelope.*—Large numbers frequent the estuary and bay, sometimes arriving from their breeding haunts in September. On the 12th of that month, in 1868, I saw fifty near Roserk, and they sometimes delay their departure in spring until April 20th.

Sandwich Tern, *Sterna cantiaca.*—A regular summer visitant to the bay and estuary, generally making its appearance between the last week of March and the middle of April, though I have seen them arrive as early as the 20th March and as late as the 26th April. They breed on the little bog-lake of Rarooyeen. I need not repeat the particulars here, as I have already given a detailed account of their fresh-water breeding haunts in 'The Zoologist' for March of the present year (p. 101).

Common Tern, *Sterna hirundo.*—Common; visiting us regularly every summer, but I have never seen them here before May. They breed on some of the flat islands in Lough Conn.

Arctic Tern, *Sterna arctica.*—I have occasionally shot specimens of this Tern in the estuary and bay during summer, but I have not been able to ascertain whether it breeds in the district.

Lesser Tern, *Sterna minuta.*—Occasionally seen in summer. On the 24th May, 1851, I shot one out of a little flock fishing in the Moyne channel; and in July, 1861, on the sands near Killala, I saw two old birds with a young one. The latter, though able to fly pretty well, had the long feathers of its wings not fully grown up.

Black Tern, *Sterna nigra.*—Very rare, and has only once come under my notice. On the 12th October, 1859, as I was fishing for sea trout near Bartragh I remarked a group of four or five small Terns resting on the sands. I at first took them to be the young of the Common Tern; but shortly after they commenced to hawk after insects, and the very sudden and adroit twists and turns they made in pursuit of their diminutive prey at once showed that they were birds I had never seen before. On shooting a pair I found they were the Black Tern in immature plumage, and it is not improbable that they had been bred on one or other of the bog-lakes of the district.

Black-headed Gull, *Larus ridibundus.*—Resident and breeds in large numbers on several of the lakes of the district. Cloonagh Lake, about two miles from Ballina, is a favourite resort, as also Rarooyeen, the breeding ground of a large colony. In the middle of the little lough there is a small island about fifteen yards in diameter, upon which the nests are placed so thickly that it is almost impossible to walk without damaging either nests or eggs. When I last visited the island I counted upwards of two hundred nests with eggs or young, independently of the numerous nests built amongst the reeds and bulrushes which surround the island and grow on the margin of the lake. In the centre of the island, under a small bush quite in the middle of the gulls, I discovered two wild ducks' nests, containing eight and nine eggs respectively, upon which the ducks were quietly hatching, undisturbed by their noisy neighbours, whose cries were almost deafening while we remained near them.

Kittiwake, *Larus tridactyla.*—Numerous in summer, but only only occasionally seen in winter. Thousands breed on the high cliffs of Downpatrick Head.

Common Gull, *Larus canus.*—Very common in winter; a few occasionally seen in summer. Previously to 1855 a few pairs bred on a little rocky islet in Lough Talt, situated in the Ox Mountains, County Sligo, about ten miles from the sea. I have seen the young birds, scarcely fledged, on the lough, and an old man living close by told me they have always bred there. Since 1855, however, boats have been put on the lake for the use of trout-fishers, and the place has become too much disturbed, especially in May, for the gulls to resort there for breeding.

Herring Gull, *Larus argentatus.*—Resident and common; breeding on the cliffs of Downpatrick Head.

Lesser Black-backed Gull, *Larus fuscus.*—On the contrary, is rare. I have seldom met with it.

Great Black-backed Gull, *Larus marinus.*—Common on the estuary during winter, and ten or twelve pairs nest on the pillar-like rock of Downpatrick Head. This rocky pillar, situated about one hundred yards from the mainland, with deep water between, is about one hundred and fifty feet high, with perpendicular sides, and is quite inaccessible. There are numerous shelf-like ledges along the sides formed by the decay of the softer strata, and on these ledges both species of Cormorants, Guillemots, Razorbills, Herring Gulls, and Kittiwakes rear their young in safety, quite free from molestation by man. The Great Black-backs keep possession of the flat grassy top, and rear their young apart from the ledge-breeding birds. About the end of May this rock and the cliffs of the mainland present one of the most pleasing sights that a lover of nature could wish for. Some few years ago the Great Black-backed Gulls of this locality were nearly exterminated by poison. The tenant of the Bartragh rabbit-warren, being much annoyed by rats, which swarmed in the burrows and destroyed the young rabbits, laid poisoned meat and poisoned rabbits all about the sand-hills. The Gulls, always on the look out for food, devoured this bait greedily, and were afterwards found lying dead in all parts of the island. The following winter I do not remember seeing more than one or two Gulls about the sands; indeed it took several years before their numbers at all came up to what they were before this wholesale poisoning took place.

Iceland Gull, *Larus islandicus.*—Occasionally seen in winter, but not every year. Those met with are generally immature birds, in that cream-coloured garb which I take to be the second year's plumage. I have only once seen it in the adult state, and on two occasions I think I saw birds in the first year's plumage. On the 4th December, 1851, I shot an immature bird at Bartragh. On the 9th December, 1854, I saw either an Iceland or a Glaucous Gull, but I was too far off to be able to distinguish between the species, although I was able to see quite plainly the white wings which infallibly distinguish the northern gulls. On the 7th May, 1855, a bird in splendid adult plumage flew close by the window where I was sitting at the time, and I had a first-rate view of it. On the 26th January, 1862, I caught on a baited fish-hook a fine young bird that had frequented my ploughed fields for nearly a month, feeding on the worms turned up by the plough. It seemed so tame that I thought it a pity to shoot it, so I attempted to catch it alive for the Zoological Gardens, but it had completely swallowed the hook, and was too much injured by it to live. So, having killed it, I presented it to the Dublin Natural History Society's collection. On the 22nd December of the same year I saw one, on the Enniscrone sands, so very dark in colour as to be evidently a young bird of the year. In 1866, on the 6th January, I shot another young bird in one of my fields, and on the 19th February I saw one at Enniscrone. In 1873, on the 26th January, as I was talking to a friend near Dooneen House, a young bird flew close past us and alighted on the high road about thirty yards off; after looking about for awhile it flew along the road, as if searching for food, for about two hundred yards, and then passed over the adjoining fields. The last time I had the pleasure of seeing one of these northern visitors was on the 28th January of the present year. It was resting amongst a flock of Common and Black-headed Gulls in one of my pasture fields.

Eider Duck, *Anas mollissima.*—An extremely rare visitant. In March, 1870, I observed a pair of immature males near Bartragh, one of which remained about the river and estuary all through the summer and autumn. I shot it near Killanly on the 6th October following. Of this bird I have already given a full account in 'The Zoologist' for February of the present year (p. 50). In December, 1870, my friend Captain Dover obtained a beautiful adult male near Bartragh. Both specimens are now in the Museum of the Royal Dublin Society.

Black Scoter, *Oidemia nigra.*—Very rare. I have only once met with it, in the winter of 1857, when a pair frequented the channel near Bartragh for some weeks.

Pochard, *Fuligula ferina.*—I once shot a solitary female Pochard near Moyview, as it was feeding in the shallow water on the sand, but this is the only one I ever saw in this district.

Scaup, *Fuligula marila.*—Not often seen. I once shot a duck of this species as she was feeding in the channel here, and in January, 1875, I saw two males and a female feeding in the tidal part of the river near Moyfort. Captain Dover, when out punt-shooting, has occasionally seen a few on the river.

Tufted Duck, *Fuligula cristata.*—A winter visitant to the lakes. I have seen it on Lough Conn, but never met with it on the estuary.

Long-tailed Duck, *Harelda glacialis.*—A pretty regular winter visitor to the bay and estuary from 1851 up to 1861. During that period I noted their occurrence every year, except in the years 1853, 1854 and 1860, but the reason of their not appearing during those years in the estuary may have been that they confined themselves altogether to their favourite feeding grounds close to the breakers of the Killala and Moy bars, and did not come into the more accessible parts of the river and estuary, where they would have been more easily observed. During the above-mentioned years they appeared in flocks of from five to fifty; but when they came up the river I only remarked one or two pairs, sometimes only a solitary bird. I have observed them early in October, and once remarked a pair remaining there up to May 6th. On the 31st December, 1861, I shot a fine adult male, and from that time gave up noting their occurrence, for I then came to regard them as regular winter visitors. My friend Captain Dover, who commenced punt-shooting in the estuary in 1868 and has continued to shoot there up to 1876, has only met with this species occasionally, and not every year, during that period. In April, 1875, I saw a pair near Killala, and shot the female, but I have not met with a single bird for the past two winters, although I have closely watched for them in their former favourite feeding grounds. Unless their food has failed in this locality, I cannot account for their desertion of it, as the neighbourhood of their feeding grounds is now much less disturbed than when they regularly visited it.

Goldeneye, *Anas clangula.*—A regular winter visitor, but seldom comes from the inland waters to the tidal parts of the river earlier in the season than February and March, when a few small flocks may be seen near Belleek demesne and Moyfort, about a mile below the town of Ballina.

Redbreasted Merganser, *Mergus serrator.*—Resident and common, breeding on Lough Conn and other suitable lakes. They sometimes assemble in large flocks on the river near Roserk, and on May 2nd I saw a flock of twenty-four birds close to the shore here, all of which appear to have paired.

Eared Grebe, *Podiceps auritus.*—Very rare. In February, 1852, I saw a pair of Grebes in the Moyne channel, and one which I shot proved to be an Eared Grebe in immature plumage.

Little Grebe, *Podiceps minor.*—Resident and breeds on the little loughs throughout the district. During the winter a little party of five or six birds generally come down to the river and haunt the shores of the islands near Bartragh until March.

Great Northern Diver, *Colymbus glacialis.*—A regular winter visitant. Its favourite haunts are in the bay and estuary, where during winter and spring a few may be always seen. They generally take their departure for their summer quarters about the latter end of April or beginning of May, although sometimes they remain later. Before leaving many assume the summer plumage. On the 24th May, 1851, I had the pleasure of seeing a sight not often witnessed, *viz.* a flock of ten Northern Divers, nine of which exhibited the beautiful plumage of summer. I met with them in the open bay between Bartragh and Killcummin Head, and they had evidently congregated in preparation for their final departure.

Red-throated Diver, *Colymbus septentrionalis.*—More numerous than the last mentioned. Many assume the breeding plumage before leaving in April and May.

Black-throated Diver, *Colymbus arcticus.*—Very rare. One exhibiting the fine black throat, and apparently in full summer plumage, was seen by my brother, Mr. E. H. Warren, near Bartragh, in April, 1851.

Common Guillemot, *Uria troile.*—Very common, and breeds in large numbers on the cliffs of Downpatrick Head.

Ringed Guillemot, *Uria lachrymans.*—Has been obtained on two occasions. On October 23rd, 1862, I shot one in the channel near here, and on the 23rd April, 1875, I killed a second one in the Moyne channel.

Black Guillemot, *Uria grylle.*—Resident. Breeding in very limited numbers between Kilcummin and Downpatrick Heads.

Little Auk, *Alca alle.*—Has only twice come under my notice. On the 22nd December, 1862, I found four nice specimens thrown up by the surf on the Enniscrone sands, and a fifth on the Moyview shore. Although dead they were quite fresh and uninjured. Again, on the 17th December, 1863, I found a beautiful specimen thrown up by the surf on the same part of the sands.

Puffin, *Mormon fratercula.*—Only met with in winter, and these were dead birds (chiefly young of the year) thrown up by the surf on the Enniscrone sands. On one occasion I found two birds alive, but so thoroughly waterlogged as to be unable to move.

Razorbill, *Alca torda.*—Breeds on the same cliffs as the Guillemots. Occasionally in winter I have found dead birds cast ashore on the Bartragh sands.

Cormorant, *Carbo cormoranus.*—Very common on the estuary and river, extending its fishing excursions also to the inland lakes. It breeds about Downpatrick Head in considerable numbers. When visiting the fresh water they commit great havoc amongst the trout and salmon fry. One shot this spring on the Bunree—a tributary of the Moy—had twelve or fourteen trout in its stomach, one of which was nine inches long.

Green Cormorant, *Carbo cristatus.*—Numerous on the tidal parts of the river and estuary. It appears to be strictly marine in its habits, for I have never seen it either on the lake or upper part of the river. It breeds at Killcummin Head and on other suitable cliffs round the coast.

Gannet, *Sula bassana.*—Often seen during summer in the bay, and probably breeds on the Stags of Broadhaven and other similar islands off the Achill coast. I cannot say with certainty whether it breeds on the Mayo coast, for it is difficult to obtain reliable information. Few persons here take any interest in our sea-birds; and I have had neither time nor opportunity to explore the parts of the coast to which I refer.

Glaucous Gull, *Larus glaucus.*—Has not come under my notice so often as the Iceland Gull, and is of a much more wary and distrustful nature, at least such is my experience. In 1859 I first saw the Glaucous Gull during some snow, on the 14th December, when I came across a fine bird on the shore here, which, although I fired at and severely wounded it, unfortunately got away. In March, 1871, I saw an adult bird on two occasions, but was unable to secure it; and several times during January, 1873, I saw another (also an adult bird) about the sands and river. At length, on the 23rd of the same month, I shot it near Ballysokeery. It was a fine bird, with some of the dusky colour of the winter plumage about the head and neck. I shot an immature bird in the winter of either 1874 or 1875—I am not certain which, as I did not note it at the time. Again, during the past winter, I several times observed a Glaucous Gull on the river and estuary; and as I was passing the Moyne channel in my punt, on the 28th March last, it flew close by me, and I could not resist the temptation of bringing it down. It proved to be a beautiful adult bird, and the only trace of either winter or immature colours was the angle of the bill being horn-colour.

Pomarine Skua, *Lestris pomarinus.*—On October 22nd, 1862, I saw several flocks passing to the southward on their autumnal migration, and obtained two birds. Both were nearly adult. As I have already given a detailed account of the occurrence of this and the following species in my notes of the autumnal migration of these two Skuas in 'The Zoologist' for November, 1875, it will be unnecessary to repeat my observations here.

Richardson's Skua, *Lestris Richardsonii.*—Also seen on their autumnal migration, and specimens obtained at various times.

Long-tailed Skua, *Lestris Buffonii.*—Has only twice come under my notice. In the first instance, on October 24th, 1862, I fired at a small Skua near Scurmore, but, although badly hit, it got away over the sand-hills. The next day, when walking on the Enniscrone sands, I found a dead Skua, which I brought home, and on skinning it I found gun-shot wounds, which proved it to have been the bird I had wounded the day before. On October 10th, 1867, Mr. N. Handy, of Ballintubber, near Killala, gave me a bird of this species that he had shot on his grouse mountain as it rose from the carcase of a dead horse upon which he said it was feeding. This specimen was nearly adult, but unfortunately had been kept too long, and was unfit for preservation.

Fulmar Petrel, *Procellaria glacialis.*—This bird (so rare on the Irish coast that Thompson mentions only three specimens as having come under his notice) has on several occasions in winter been found on the Enniscrone sands, thrown up by the surf, and occasionally on the sands of other parts of the bay which open to the north. Except in one instance, the birds were dead but quite fresh. On the 24th January, 1857, I found a young Fulmar—

I should say in the first year's plumage—thrown up on the Moyview shore, the tide having brought it in from the open bay. It was in such good condition that I sent it to my friend Dr. Harvey, of Cork, for his fine collection of native birds. For some days previously to the 24th October, 1862, there was a succession of south and south-westerly gales, but on the night of the 23rd the wind changed to the north and blew very heavily. This induced me to visit Enniscrone on the 24th, to look out for any storm-driven birds that might have come ashore. In the course of my search I found several dead Puffins (both adults and young of the year), and picked up one alive, but so exhausted that it died shortly afterwards. While engaged in examining the Puffin, my attention was attracted by a Great Black-backed Gull dragging and trying to tear something that was lying partly in the water and had just been washed ashore by the surf. On reaching the spot, I picked up an adult Fulmar, in a most wretched condition, completely water-soaked and so utterly worn out as to be unable to stand. It died shortly after I put it into my bag. A few hundred yards farther off I shortly afterwards saw the same gull, at the edge of the water, watching something he apparently feared to attack. I at once hastened to the spot, and found a second Fulmar just come ashore, and in as miserable a state as the first, except that it was not quite so weak, being able to walk a little and to use its powerful beak in self-defence against the attacks of the gull. On November 3rd, 1865, I found another specimen, quite fresh, on the sands of Enniscrone, but unfortunately the gulls had got at it before me and rendered it quite useless as a specimen. On the 3rd October, 1867, I also found a Fulmar cast upon the same part of the shore, and so fresh and uninjured that I sent it to the Dublin Society's Museum; and on the 21st October, 1868, I got another at the same place, which I sent to the Belfast Museum. In 1870, on the 4th March, I found the remains of one destroyed by gulls on the Bartragh sands; and sometime during the winter of 1872 or 1873, I got a fine bird on the Enniscrone sands, which I have now set up for myself. I have no doubt that specimens of the Fulmar would be found every year on the Enniscrone shore, and also of other migratory sea-birds, if a careful search was made during the months of October and November, and up to the middle of December, especially after heavy gales.

Great Shearwater, *Puffinus major.*—Has once come under my notice. When visiting Downpatrick Head with some friends on the 22nd August, 1859, we obtained a dead bird in the brown-mottled plumage of the first year, from a man who had fished it up on the shore a few minutes before we met him. He had some Razorbills and Guillemots which had been washed ashore dead, and we were much amused, when I offered him a few pence for the Shearwater, to hear him recommend us to take the Razorbills in preference, as they were "so much fatter, and better eating!"

Common Shearwater, *Puffinus anglorum.*—Occasionally seen along the coast between Downpatrick Head and the Stags of Broadhaven early in August. I have no doubt they nest on some part of that coast, but I cannot be certain as I never had the opportunity of thoroughly exploring it.

Storm Petrel, *Thalassidroma pelagica.*—Very seldom met with. I have been informed that they breed on some parts of the coast, but have not been able to discover the precise locality.*

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ON THE OCCURRENCE OF THE MARSH WARBLER NEAR TAUNTON.

By the Rev Murray A. Mathew, M.A.

Ever since Mr. Howard Saunders detected the Marsh Warbler, *Acrocephalus palustris*, in the collection of Dr. Woodforde, of Amberd House, near Taunton, and identified the nest and egg preserved with the birds as undoubtedly belonging to that species (*vide* 'Zoologist,' 1875, p. 4713), I have been very anxious to procure more examples in the same neighbourhood, the more so as Professor Newton, exercising a wise caution, has not, with the evidence which was then before him, felt himself justified in admitting the bird into the list of occasional visitants to England. So very closely allied is this aquatic Warbler to the Reed Warbler that it is very difficult indeed to separate skins or mounted specimens which have been any time dry. The habits, song, nest and eggs of the two birds are widely different, and the observation of these furnishes the best test for discovering the presence of the hitherto reputed scarcer bird. I was sanguine that, if the bird still visited the country near Taunton, I should be able to discover it, as I was able to secure the services of Coates, the birdstuffer, who, some twenty years ago, accompanied Dr. Woodforde when his birds with their nest were taken. Coates was well acquainted with the peculiar song of the male Marsh Warbler, which is very sweet and of considerable power, and also with the bird's more lively habits and more generous display of itself, in comparison with the Reed Warbler, which keeps itself for the most part concealed among rank herbage, where it creeps about like a mouse.

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* The scarcity of the Storm Petrel on the Mayo coast, if such is the case, would be rather remarkable, inasmuch as this bird breeds on the coasts and on the islands off the coasts of Donegal, Galway, Clare and Kerry. We can scarcely doubt that it is to be met with, if searched for, on the equally favourable shore line and the numerous islets between Erris Head and Killary Harbour.—Ed.

This spring Coates was told to keep a keen watch for the bird, and I am now able to describe the success of his search, which has resulted in the detection of four nests and the capture of one fine adult male Marsh Warbler. The first nest discovered was less than a quarter of a mile distant from the field where Dr. Woodforde's examples had been obtained, and the song of the male bird led to its detection. Accompanied by Coates, Mr. John Marshall, of Belmont, Taunton, went to view this nest *in situ* on the 22nd June last. The place chosen by the birds was a small withy-bed adjoining the turnpike-road connecting Taunton and Milverton, by the side of a small trout-stream, and almost opposite a roadside public-house. The nest was composed externally of dry bents, into which were woven one or two poultry feathers, doubtless obtained from the fowls belonging to the aforesaid hostelry, and very neatly lined with an abundance of horse-hair, gray and brown. It was very compact, of a cup-shape, and was dexterously attached to three stems of *Spiræa* (meadow-sweet), which the birds had drawn together with grass bents, and was about a foot and a half from the ground. It contained four eggs, very different in character from the eggs of the Reed Wren, with a number of which they were compared. These Marsh Warbler's eggs were larger; their ground colour was a creamy white, slightly tinged with green; a few olive blotches were scattered over them, chiefly at the larger ends, where in some of the eggs they formed a dark zone; the pointed ends of the eggs were spotless. An attempt was made, after taking the nest, to secure the old birds; but they kept themselves hidden in the herbage and among the withies, which formed a thick cover as high as a man's shoulder, and it was not until a long time had been spent in waiting that they showed themselves, and afforded a chance to the gun. Both birds were fired at, and fluttering down among the roots of the tall grass could not be secured; and Mr. Marshall finally left the withy-bed under the idea that the birds had been either killed or wounded; but this did not happen to be the case.

Ten days later Coates again visited the spot and detected the male bird, and after a short search found that the persevering pair had constructed another nest but a few feet from where the first had been placed, and that already an egg had been deposited. On hearing this good news, I waited a few days until the complement of eggs would be laid, and then, early on a beautiful July morning, paid another visit to the withy-bed. A cautious tap dislodged the hen bird from her nest, and by the movements of the tops of the withies I could see where she was creeping off through the cover, and could hear her harsh clacking note. She would not expose herself, and a shot fired where the undulations were noticed was not aimed low enough and failed to secure her. After waiting some time the male bird was suddenly seen perched on a willow overhanging the stream and was brought down. Although the presence of the female was made apparent once or twice subsequently by movements of the herbage, I failed to obtain a chance at her, and went away very contented with the male and the beautiful nest, which now contained four very richly-marked eggs. This second nest was placed exactly as the first had been, and was supported on three stalks of *Spirœa*, which the birds had laced together with dry bents. It was not so closely lined with horse-hair as the first, and altogether less material had been employed by the birds, who doubtless built with great haste with a view to repair the fortunes of their house. No poultry feathers were on the exterior, which was constructed of dry bents only. Still it was a very elegant little nest, exhibiting great ingenuity, and when cut from its position with the three rods of *Spirœa* laden on the top, with the sweet-scented white blossoms, it made a charming picture.

At the same time that Coates had reported his discovery of the first nest, he also announced the fact that another pair of Marsh

Warblers frequented a ballast-pit not far from the Tone, and close to the Great Western Railway, about a mile to the east of Taunton. When this spot was visited, a little search resulted in the discovery of the nest, which then contained four eggs. I was anxious that these should be hatched off, in order that Coates might be able to snare the old birds and the young. He was therefore directed to keep careful watch upon it, and after another visit he returned to say that one young bird had been hatched, and that the other three eggs appeared addled, and that a pair of Red-backed Shrikes were in dangerous proximity to the nest. Mr. Marshall therefore had one of the addled eggs taken from the nest, which precisely resembled the eggs I have described above, and appointed a morning for Coates to attempt to snare the old birds. Unfortunately, when this morning arrived, it was discovered that some birds-nesting boys had been beforehand; the herbage was trampled down in all directions, and the precious nest had disappeared.

We were, however, consoled for this misfortune by hearing the next day that Coates had discovered that the other pair of Marsh Warblers had built a second nest. The small withy-bed which was selected for it appears to be a favourite resort for birds. It is barely the eighth of an acre in extent, yet besides the Marsh Warblers it gave shelter to a pair of common Whitethroats and their nest, a pair of Sedge-birds and nest, a pair of Bullfinches and their brood; and high up in a hazel-bush overhanging the stream a dome-shaped nest was found, which on examination proved to be built of hay, in the form of a perfect dome, with a small hole for ingress, and contained three freshly-laid eggs of the House Sparrow. We all agreed that it was a very unusual site for a Sparrow's nest, and a singularly neat nest for the bird. While watching for the Marsh Warblers, a Lesser Spotted Woodpecker suddenly rose from the willows by the stream and almost flew in our faces, and there were numerous Chiffchaffs and Willow Wrens all round us, and doubtless many other nests in the little cover besides those we detected. The male Marsh Warbler captured is a very perfect specimen, and when picked up its breast was suffused with a delicate primrose-yellow, a tint which proved extremely evanescent, and had almost disappeared before the bird was completely cold. We took careful notes of the coloration of the soft parts directly the bird was in our hands, and observed that the upper mandible was a pale horn-colour, the lower mandible primrose-yellow; inside of rictus bright yellow; eyes dark violet, with dark brown irides; legs pale flesh-colour, tinged with brown; soles of feet extremely bright primrose-yellow (this singular characteristic pertains also to the Reed Warbler); claws pale flesh-colour, tinged beneath with yellow.

Mr. Dresser's test of the comparative length of the primaries held good, the second primary being found conspicuously longer than the fourth. I do not think much of this mark of distinction, for on looking at two fine adults of what I have always considered the Reed Warbler,—one shot near Cambridge, the other taken at the spring migration near Brighton,—I find that in both the second primary is much longer than the fourth. It is just possible that both these birds may be *A. palustris*, for they certainly have backs more of an olive-brown than of a russet-brown; and this is Mr. Howard Saunders' differentiation of the two species. In general coloration the Marsh Warbler and the Reed Warbler are, as I have said, almost identical, and perhaps the shades of colour on the upper parts furnish the only point of distinction between them, and even these shades approach one another very closely as the skins dry and the general tone of colour fades and approximates to what a witty friend of Mr. Dresser well termed "museum colour."

I may add to this account the statement of Coates, that during his experience as a bird-catcher in the environs of Taunton, he has at different times taken more than a dozen nests similar to those described above, and with eggs in them of the same character. Mr. Marshall, however, thinks that he can have taken none during the last thirteen years, or they would have been brought to him, and possibly this statement of the birdcatcher may be an exaggeration.

Since writing the above, Mr. Howard Saunders has kindly lent me a beautiful skin of a male *A. palustris*, labelled "Astrachan," to compare with my Taunton bird; and although this specimen is in perfect plumage, and mine is rather ragged from moult having set in, after placing the two side by side, I can only detect a perfect resemblance. The olive tints of the back are the same, and so are the white under parts, on which a delicate primrose tinge is still more or less apparent; and in both birds the second primary is the longest in the wing. In 'Our Summer Migrants' (p. 98), I see Mr. Harting says that in *A. palustris* the tarsi when dry are of a yellowish brown, while those of *A. strepera* become hair-brown. In Mr. Saunders' skin the tarsi are, as Mr. Harting describes, yellowish; whereas in my mounted specimen the legs are now as dark as those of a Chiffchaff, the reason for this being the dark-coloured iron wires which are visible through the thin membranes. When my bird was fresh, the legs, as stated above, were pale flesh-colour, slightly tinged with primrose.

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OCCASIONAL NOTES.

MARTENS IN SUFFOLK.—The following communication from Mr. J. H. Gurney, published in the 'Transactions of the Norfolk and Norwich Naturalists' Society' (vol. ii. pp. 223–4), may be of interest to your readers, as it shows that less than seventy years ago Marten-cats were found in considerable numbers in the county of Suffolk. The large number of Rats destroyed is also worthy of note; it is evident they received from the gamekeepers the attention they deserve, whereas now their natural enemies are assiduously destroyed, but the Rats, secure in the quiet of the covert, increase to an enormous extent, and many an empty nest is the result. Mr. Gurney says:—"I have a cutting from a newspaper of the year 1811, by which it appears that at the Suffolk Gamekeepers' Annual Meeting, held at Bury on December 9th of that year, a prize was given to one Sharnton as the most successful gamekeeper. He had the looking over (with two under-keepers) of 4000 acres, but in what parishes the manor lay is not stated; evidently, however, it was in Suffolk. Sharnton gave in an account of vermin destroyed by him and his assistants in twelve months, which I think may be worthy of a place in the records of our Naturalists' Society, as bearing on the existence of the Marten in Suffolk, sixty-five years ago. His account is as follows:—Foxes, 22; Martens (spelled 'Martins'), 43; Polecats, 31; Stoats, 416; Crows and Magpies, 120; Hawks of all kinds, 167; Field Rats, 310; Brown Owls, 13; Wild Cats, 7."—T. SOUTHWELL (Norwich).

REPORTED OCCURRENCE OF THE WILD CAT IN THE ISLE OF WIGHT.—A veritable Wild Cat, probably the last of the race, was shot some months since near St. Helen's, in which neighbourhood there are still extensive woods, chiefly on the Nunwell Estate. Though occasionally seen by the gamekeepers, it had managed to evade them for years. It came into Mr. Careless's possession the day it was killed. It proved to be a male, three feet in length and nine pounds fourteen ounces in weight. It stands high on the legs—namely, about fourteen inches—and is a very formidable looking animal, with powerful jaws. The distribution of colours is very similar to those of the Inverness specimen described in 'The Zoologist' (2nd ser. p. 4791), but this cat is darker, and seemingly more aged. How it could have escaped for so many years is wonderful.—**Henry Hadfield** (Ventnor, Isle of Wight).

[We are extremely sceptical in regard to the alleged existence of Wild Cats in the South of England at the present day, and, notwithstanding the colour and large size of many of the animals killed, we cannot help regarding them as of hearth-rug ancestry. We should like to know what our readers in the New Forest have to say on the subject.—Ed.]

Purple Gallinule in Somersetshire. — On visiting the British Museum, a few days since, I carefully looked at the different species of *Porphyrio* in the National Collection, the result being that I satisfied myself that my Irish example is not the small *Porphyrio Martiniquii*, but the South European *P. veterum*. I have read Mr. Smith's remarks on the specimen of this *Porphyrio* obtained in Somersetshire, and as he objects to regard it as a straggler to this country, he is bound to bear the *onus probandi*, and to bring forward something more than a mere surmise that it is only a bird that has escaped from confinement. Unless, as I have already remarked, there is something altogether exceptional in the bird which is met with at large, it is, in the absence of proof to the contrary, fairly entitled to be ranked as a voluntary straggler to this country. The facilities of importation which exist at the present time, which are rendering this country what Pericles claimed Athens to be, the emporium of the whole world, and that, so far as concerns living specimens of foreign animals as well as the ordinary spoils of merchandize, must not be stretched too far to account for every unusual bird found wild in our woods and fields. To do this is greatly to destroy the romance of British Ornithology. The attitude of the ornithologist in this country should be one of general expectation. From the situation of this island, it offers a natural resting-place to birds which may have lost their reckoning in their migrations both from the Old and the New World. To pronounce, then, of any new-comer to the British list that "it is only an escape" is to cast a damper upon this expectant feeling, and to abandon the peculiar fortune with which the position of this country has enriched its naturalists. It is for this reason, chiefly, that I decline to retire from my defence of the Somersetshire Purple Gallinule, and to ask Mr. Smith to furnish proofs that the specimen in question escaped from an aviary. Does he know of any one who, residing not far from the locality of its capture, happened about that time to lose so rare a bird? Even if he did, I might enquire for certain marks of confinement which all birds, however handsomely treated in the aviary, are almost sure to exhibit; dull, soiled, or abraded plumage; less brilliancy in the coloration of the softer parts, the skin of the bill and legs—and here we have a never-absent sign of a bird which has been for any length of time deprived of its freedom; and if none of these could be pointed out in the captured specimen, I should then, in spite of one having been known to have strayed from an aviary somewhere at hand, feel as much entitled to my assumption that this bird, which showed no traces of its captivity, must be another, and *not* the escaped one, as an objector would be justified in claiming it as the missing bird. I see that Mr. Dresser, after mentioning two examples of the Purple Gallinule which had been obtained in the North of England, adds that these were probably escapes, and his decision justly carries great weight; but Mr. Gray, who was fortunate enough to handle, in the flesh, one which had been shot in Argyleshire, could find on the bird no signs that it had ever been subjected to confinement. Bearing in mind that these birds are migratory, and that the mouth of the Rhone or the coast of Portugal is at no great distance from this country for a bird when fairly on wing, *Porphyrio veterum* might justly object to be refused a place among the list of our chance visitors, which includes many other birds even less likely than this to wander to our coasts.—MURRAY A. MATHEW (Bishop's Lydeard, Taunton).

THE MIGRATION OF BIRDS.—I have read the remarks of Mr. Cordeaux in 'The Zoologist' for May (p. 205), on the subject of migration, and am almost tempted to reply. I cannot afford the time, however, even if you would grant me the space. I will only observe that there are apparently three classes of thinkers. First, those who believe in "an intuitive instinct which almost seems like a sixth sense," of which number Mr. Cordeaux is one. Secondly, those who vote avine migration—and with it, I suppose, all migration—to be a mystery. Thirdly, persons, of whom I am one, not able to understand "the sixth sense," not finding any great mystery, but regarding avine migration as part of the general law of flux and reflux which is apparent in so many organisms, &c., in the orb in which we dwell, and which is one of the conditions of the Universe. I may remark, however, that I do not go the full length attributed to me by Mr. Cordeaux, for to deny *any* instinct to animals would no doubt be "absurd." I only say these few words for fear silence might be thought discourteous towards a gentleman who has worked at this subject for "more than twenty years," in fact, almost as long as I have.—GEORGE DAWSON ROWLEY (Chichester House, Brighton).

CUCKOO'S EGG IN A BLACKBIRD'S NEST.—Whilst looking for Reed Warblers' nests on the Thames this summer I found a Cuckoo's egg in a Blackbird's nest, which was built in willows overhanging the river. A few yards further on I found another egg in a Reed Warbler's nest, agreeing with the first in colour, &c., and evidently laid by the same bird. Although this is not the first instance that has been known of a Cuckoo placing its egg in a Blackbird's nest (see Yarrell's 'British Birds'), I think it is of sufficiently rare occurrence to be recorded. The notice of a Cuckoo's egg in a Swallow's nest in 'The Zoologist' for June (p. 260) is very interesting, and although it is the first time the egg has been found in the nest of this species, yet as in 'The Zoologist' for 1869 (p. 1866) a description was given of a young Cuckoo falling out of a Swallow's nest, it is to be presumed that the egg must have been previously laid there. If any of your readers know of an instance of a Cuckoo's egg being found in the nest of the Twite, Goldfinch, or Lesser Redpoll, I shall esteem it a favour if he will send me the particulars.—EDWARD BIDWELL (7, Ormond Terrace, Richmond).

[In the account referred to ('Zoologist,' 1869, p. 1866), no evidence is adduced to prove that the young Cuckoo was ever in the Swallow's nest. The statement to that effect is purely inferential. It is just as probable that the bird may have been hatched in the neighbouring nest of a Water Wagtail, and on perching on a chimney top in one of its early flights may have overbalanced itself and tumbled down.—ED.]

CUCKOO EVICTING YOUNG HEDGESPARROWS.—A Hedgesparrow hatched in May four young ones in a thick bush of *Arbor Vitæ* by my drawing-room window. One afternoon I saw a Cuckoo fly down right into the middle of the bush, and a great scuffle ensued. I ran up and found the nest empty, and all four young birds on the ground. I replaced them in the nest, and thought I had frightened away my Hedgesparrows' enemy for good. However, three days after I looked at my nest on returning from London, and found the four young birds on the ground. They were stiff, and I thought dying, but I replaced them as before. Under their mother's warm feathers three of them recovered; one died. A day or two after I found on my return from London all the birds again on the ground quite dead. They had evidently been out of their nest some hours. I have not a doubt that on each of the last two occasions the Cuckoo was the culprit, but she (if it was a she) never laid an egg, and the only just verdict I can think of is "malice prepense."—J. H. BUXTON (Nunsbury, Hoddesdon).

THE COLLARED DUCK, *Fuligula collaris* (Donovan).—When at Liverpool, in April, 1876, I was informed by Mr. T. J. Moore that he had recently met with three ducks of the above species in St. John's Market. This is a capital market for rarities. On a former visit I found a Nyroca, or White-eyed Pochard, there among a row of Tufted Ducks. In the present case there was no doubt of the Collared Ducks having been imported from America; but the species was met with in Leadenhall Market, London, so long ago as January, 1801, by Donovan (who seems to have been the first describer of it), and why it was excluded from the British list by Yarrell I do not know. The American Wigeon, which was also obtained in Leadenhall Market, was admitted on the ground that it was found here before it became the custom to import American wild fowl, and the same argument would apply even more strongly to the Collared Duck of Donovan. If English naturalists have not admitted it, however, the French have done so for them In Degland and Gerbe's 'Ornithologie Européenne,' it is included (No. 495), and readers are informed that it has been observed several times in Great Britain. Stories lose nothing in crossing the channel! Its habitat is thus given in Coues' 'Birds of the North-West' (p. 574):—"*Hab.* The whole of North America, breeding far north, wintering in the United States and beyond. South to Guatemala. Cuba. Jamaica."—J. H. GURNEY, JUN. (Northrepps Cottage, Norwich).

POCHARDS BREEDING IN THE REGENT'S PARK.—For the last two months I have noticed a pair of Pochards on the ornamental water in the Regent's Park; and feeling certain that they had nested there, I went to look for them on June 28th, and found they had hatched out five young ones. The latter swim and dive like the old ones.—G. ATKINS (21, Park Village East).

[We also have had an eye on these Pochards, and observed the young for the first time on Saturday, June 23rd. They were then swimming with their mother and seemed to be not more than a day or two old. The male parent did not appear, and it is therefore not quite certain yet whether the young are pure-bred Pochards or hybrids.—ED.]

TAWNY PIPIT IN SUSSEX.—I am able to add another unrecorded Tawny Pipit from Sussex, which is also an immature bird, in the plumage described by Mr. Bond (p. 299). This example was shot at Ditchling Bostel, on the 29th September, 1876, as I was informed by Mr. Pratt, of Brighton, from whom I obtained it. There is a great superficial resemblance between the Tawny and Richard's Pipits. The Tawny might well pass for a small example of *Anthus Richardi*. Both have long tarsi, and pretty much the same coloured plumage. I was struck by the resemblance when examining Mr. Vingoe's Penzance specimen last summer, which, if I remember rightly, was also a bird of the year.—MURRAY A. MATHEW (Bishop's Lydeard).

UNUSUAL SITE FOR A KESTREL'S NEST.—A Kestrel laid this summer in a hen-roost in a long sheep-trough, and hatched four young ones. Whilst sitting (in May) a day's sheep-shearing was carried on, from 6 A.M. till 8 P.M., but did not disturb the bird, although quite close to her. The young ones are now seventeen days old. I can see them every day from a stage in the barn, and it is most amusing to me to observe their domestic arrangements. At first the young were treated with the brains of young Plovers, but now they get moles, mice, and young birds. The lady rules the roast, and when both the old birds come together with food, she manages to convince her mate that a mole is better than a young blackbird.—FREDERICK STRATTON (St. Joan-a-Gore, Devizes).

Pied Flycatcher and other Birds in the Isle of Wight.—On the 30th April, when at Sea View, I was asked to identify a strange bird shot in the neighbourhood on the 28th. It proved to be a male Pied Flycatcher, in perfect plumage. This species is of rare occurrence here. Yarrell refers to a specimen shot in the island, and I believe one was killed near Freshwater a few years since. I was shown a Thick-kneed Plover, shot in the island on March 12th, 1876. Mr. Careless has had the following birds brought to him in the flesh, all killed in the island:—Crossbill (in January), Black-throated Diver (during the winter), Velvet Scoter, Great Black-backed Gull, Fulmar Petrel, Crested Lark, Short-eared Owl, Sheldrake, Lesser Spotted Woodpecker (a rare visitant), also a Hooded Crow—seldom met with in the island.—Henry Hadfield (Ventnor, Isle of Wight).

[We should like to know something more about the Crested Lark. When, where, and by whom shot, and by whom identified? We have seen many a Sky Lark with a good crest fondly regarded by its owner as a veritable Crested Lark.—Ed.]

Singular Variety of the House Martin.—I have lately obtained from a birdstuffer at Worthing, in this county, a very beautiful variety of the House Martin, the whole of the quills of the wings and the bastard wings being of a pure white, while the rest of the plumage is of the usual colour. It is a bird of the year, and was shot near Worthing in the autumn of last year.—William Borrer (Cowfold, Sussex).

Spoonbills in Suffolk in June.—During the early part of June a flock of nine Spoonbills frequented the marshes adjoining the coast near Aldborough, and to the credit of the resident gunners,—who, I am glad to say, respect the Wild Fowl Protection Act,—they were allowed to remain unmolested. It is to be hoped that continued protection may beget sufficient confidence in these beautiful birds to induce them again to take up their quarters, as of old, in this country during the breeding season.—F. Kerry (Harwich).

Spoonbill near Ely.—A spoonbill has been seen in the neighbourhood of Ely for some days, but has now (July 9th) departed. I am glad to say it escaped the snare of the fowler.—H. M. Upcher (Feltwell).

Wings against Steam.—On July 13th there was a race from Dover to London between the continental mail express train and a carrier pigeon conveying a document of an urgent nature from the French police. The pigeon, which was bred by Messrs. Hartley and Sons, of Woolwich, and "homed" when a few weeks old to a building in Cannon-street, City, was of the best breed of homing pigeons, known as "Belgian voyageurs." The bird was tossed through the railway carriage window by a French official as the train moved from the Admiralty Pier, the wind being west and the atmosphere hazy, but with the sun shining. For upwards of a minute the carrier pigeon circled round to an altitude of about half a mile, and then sailed away towards London. By this time the train, which carried the European mails, and was timed not to stop between Dover and Cannon-street, had got up to full speed, and was proceeding at the rate of sixty miles an hour towards London. The odds at starting seemed against the bird, and the railway officials predicted that the little messenger would be beaten in the race. The pigeon, however, as soon as it ascertained its bearings, took the nearest homeward route in a direction midway between Maidstone and Sittingbourne, the distance, "as the crow flies," between Dover and London being 70 miles, and by rail 76½ miles. When the Continental mail express came into Cannon-street Station, the bird had been home 20 minutes, having beaten Her Majesty's Royal Mail by a time allowance representing 18 miles.—*From 'The Times,' July 14th.*

RARE BRITISH FISHES OFF BABBICOMBE.—One of the rarest of British fishes—the Black-fish, *Centrolophus pompilus*—was taken this morning (June 15th) off Babbicombe, by Mr. Gaskin, of that place. It is curious that the seine inclosed at the same time another fish of great rarity, the Short Sun-fish, *Orthagoriscus mola.* Both were submitted to me for identification.—P. H. GOSSE (Sandhurst, Torquay).

[The Black-fish is figured in Couch's 'Fishes of the British Islands' (vol. ii. p. 123, pl. xc.), and all the specimens mentioned by that author seem to have been met with in Cornwall. He states, however, on the authority of Mr. Joshua Alder, that an example has been taken at Cullercoats. The Short Sun-fish will also be found figured in the same work (vol. iv. p. 377, pl. ccxlv.). This strange-looking fish is generally spoken of as rare, but on the south and west coasts can scarcely be considered so, for hardly a year passes without the capture of a few being reported. They are generally taken during the warmer months of the year.—ED.]

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

June 7, 1877.—Prof. ALLMANN, F.R.S., President, in the chair.

The first zoological paper read was by Mr. Robert M'Lachlan, *viz.*, "On the Nymph Stage of the *Embidæ*, with Notes on the Habits of the Family, &c." The author stated that in 1837 Prof. Westwood (in Trans. Linn. Soc.) instituted the characters of *Embia*, a genus of insects allied to the white ant. Lately, therefore forty years after, Mr. Michael discovered some orchids partially destroyed by an insect found to belong to the *Embidæ*; and the nymph stage obtained fills a gap in its history. Mr. M'Lachlan, in allusion to the insect's habits, states that M. Lucas and others mention its being carnivorous, and spinning a silken web like that of a spider, but which he believes to be for protection from its enemies, while he doubts its carnivorous habits, regarding it as probably a vegetable feeder. He then entered into the subject of systematic position, structure, distribution, number of species, concluding with a detailed description and zoological remarks on those now known. He observed that the larva of a species of *Embia* has been noticed in fossil amber. The living forms inhabit both hemispheres at spots wide apart. None are known from Australia.

Mr. G. Busk verbally explained the more important points in the succeeding paper, *viz.*, "Observations on British *Polyzoa*," by the worthy field-naturalist, Mr. C. Peach. The latter has faithfully described and delineated a number of forms of this marine family, some of which he considers as new to science, and of other known genera and species he adds much information regarding their habits and history. For instance, *Scrupocellaria scruposa* he finds has tubulous wool-fibre-like roots, armed with spines, by which it attaches itself to certain sponges, &c., a fact which appears to have been overlooked in all works on British Zoophytes, though Mr. Busk, in his 'Catalogue of Marine *Polyzoa*,' has adverted to *S. Macandrei* from the coast of Spain and *S. ferox* from Bass' Straits as possessing "radical tubes hooked." *Eschara stellata* and *Discopora meandrina*, both dredged by Mr. Gwyn Jeffreys off Shetland in 1864, Mr. Peach considers as new species.

A short, partly descriptive, paper by Mr. Edward J. Miers, "On Species of Crustacea living within the Venus' Flower-basket (*Euplectella*) and in *Meyerina claviformis*," was laid before the meeting. Among the late Dr. J. S. Bowerbank's collection of Sponges recently acquired by the British Museum authorities was a bottle containing Crustacea from within *Alcyonellum speciosum*, from Zebu, Philippines, ninety-five fathoms. The existence of Crustacea within some of the vitreous sponges has been long known; nevertheless a technical account of the species so imprisoned has been hitherto somewhat defective. Mr. Miers' account of *Spongicola venusta*, De Haan, of *Æga spongiophila*, Semper, and of *Cirolana multidigitata* supply this want.

Several interesting botanical papers were read and discussed, *viz.*, Dr. Maxwell Masters, "On the Morphology of Primroses;" the Rev. G. Henslow, "Note on the Numerical Increase of Parts of Plants;" Mr. Marcus Hartog, "On the Floral Development and Symmetry in the Order *Sapotaceæ*;" and "A Notice of the Lichens of the 'Challenger' Expedition," by the Rev. J. M. Crombie.

June 21, 1877.—The Rev. G. HENSLOW, M.A., F.L.S., in the chair.

Dr. John M'Donald, Gothic House, Walton-on-Thames, Surrey, was duly elected a Fellow of the Society.

Mr. P. Herbert Carpenter, B.A., orally demonstrated from diagrams the gist of a well-illustrated memoir by him, "On the Genus *Actinometra* (Müll.), with a Morphological Account of a new Species from the Philippine Islands." In his MS. the author shows the impossibility of adhering to Müller's classification of the *Comatulæ*, according to the number of the ambulacra which radiate from the peristone, and the necessity of extending the limits of Müller's genus *Actinometra*, so as to include all those forms of *Alecto*, in which the mouth is eccentric, and which have no place in the genus *Antedon* as defined by Mr. Norman. Another feature of many *Actinometræ* is the complete closure of the ambulacral grooves on more or fewer of the posterior or aboral arms, and the entire absence from such arms of a ventral ciliated epithelium, and of the so-called ambulacral nerve beneath it. The rosette of *Actinometra* presents a more embryonic condition than that of *Antedon*, the primitive basals undergoing a less complete metamorphosis; but it is closely anchylosed to fine prismatic pieces, which result from more or less complete ossification round the connective tissue-fibres of the synostosis between the centro-dorsal piece and radial pentagon. These pieces, traces of which also occur in *Antedon Eschrichtii* are closely similar to the fine basals of *Solanocrinus costatus* of the Wurtemburg Jurakalk, except in the fact that they do not as in *Solanocrinus* appear on the exterior of the calyx.

In the absence of the author, the Secretary shortly referred to a "Description of Genera and Species of Australian Phytophagous Beetles," by Dr. Joseph S. Baly. In this communication fourteen species, in all, of the genera *Triocephala*, *Rhombostromus*, *Bucharis*, *Polyachus* and *Ditiopidus* are treated of.

The title only of Mr. R. Bowdler Sharpe's third part of his "Contributions to the Ornithology of New Guinea" was announced, the author himself not being present.

This was followed by Dr. W. C. M'Intosh's paper, "On the *Annelida* obtained during the Cruise of H.M.S. 'Valorous' to Davis Strait in 1875." The specimens were collected by Dr. Gwyn Jeffreys, though barely in such good condition as those received from the 'Porcupine' and 'Osprey' Expeditions. Since the days of Fabricius, the Annelids of the Greenlandic Seas have received unusual attention in comparison with those of other parts, Œrsted, Malmgren, Otto Zorell, Luthen and others having added considerably to the number known. Though, by an unfortunate circumstance, the dredging received a check, and limited the species of marine *Polychæta* to about sixty-eight, yet of this comparatively small number thirteen are new to the Greenlandic area, and in addition nine are new to science. As far as at present can be judged by the Annelids, Dr. Jeffreys' opinion, that the Greenlandic Invertebrates are more European than American, is substantiated. Dr. M'Intosh describes in detail the various species and genera obtained, and gives good drawings of the anatomy of some of the new and most remarkable forms. He also adds a useful note concerning the best method of preserving these soft and delicate creatures.

The abstract of a "Monograph of the Gymnozoidal Discostomatous Flagellata, with a new Scheme of Classification of the *Protozoa*," by Mr. W. Saville-Kent, was read by the Secretary. In this communication the writer places on record the results of his extended investigations among that remarkable "collar-bearing" group of the flagellate *Infusoria* first introduced to scientific notice by the late Prof. H. J. Clark of Pennsylvania, in 1868. By Mr. Kent's researches, the group is now made to embrace no less than eight well-marked genera and about forty species, in place of the two genera and four species first introduced by Prof. Clark. The majority of the members of this group are sedentary in their habits, being attached in a sessile manner by a pedicle to aquatic objects. Compound colonies are frequently produced, rivalling in luxuriance, &c., colony stalks of *Epistylis*, &c., among higher ciliate *Infusoria*. Some are characterized by inhabiting transparent Coricæ, after the manner of *Vaginicola*, and others rove freely through the water. All are of such minute size as to require a magnifying power of at least 500 diameters for their investigation, and possibly to this circumstance they may so long have escaped the attention of observers. The chief significance that attaches to the collar-bearing group in question is the circumstance, first recognized by Prof. J. Clark, that similar animalcules constitute the fundamental basis and the essential living units of all known Sponges. This identity of structure, confirmed by the investigations of Mr. Carter, has been followed up in Mr. Kent's memoir, and is held by him to be subversive of Prof. Haeckel's theory as to the cœlenterate nature of Sponges. Mr. Kent further submits a proposition for a new classification of the subkingdom *Protozoa*, which he divides into four leading natural groups of equal value, the distinctive features of which are afforded by the characters of the oral or interruptive area. These Protozoan groups are termed by him, (1) *Olostomata*, (2) *Polystomata*, (3) *Discostomata*, and (4) *Monostomata*.

Another paper, which may be considered as appertaining to a zoological moot subject, was read by Prof. Charlton Bastian, *viz.*, "On the Conditions favouring Fermentation and the Appearances of *Bacteria*." In this the author puts his matter in a fourfold aspect:—1. He makes known in detail certain experimental conditions which he has found to be highly favourable to the occurrence of fermentation in boiled fluids. 2. He records fresh instances of the occurrence of fermentation in boiled acid fluids, which according to M. Pasteur invariably remain barren. 3. He brings forward certain crucial evidence upon the disputed interpretation of the fertility of boiled neutral or faintly alkaline fluids. 4. He adduces further instances of fermentation of fluids heated to 230° Fahr. and upwards.

The botanical contributions read in full or abstract at this meeting were as follows:—"Fungi of the Counties of Dublin and Wicklow," by Mr. Greenwood Pim; "Notes on the Peculiarities and Distribution of the *Rubiaceæ* of Tropical Africa," by Mr. P. Hiern; "Note on the Automatic Movement of the Leaves of the Blimbing of India, *Anerrhoa Blimbi* (L.)," by Mr. R. I. Lynch; and a highly interesting memoir, by Dr. D. Cunningham, "On *Mycoidea parasitica*, a new genus of *Algæ*, and the part it plays in the formation of certain Lichens."

With a few parting remarks from the Chairman, the session closed.—JAMES MURIE, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

July 4, 1877.—Professor J. O. WESTWOOD, M.A., F.L.S., President, in the chair.

The minutes of the previous meeting were read and confirmed.

Donations to the Library were announced and thanks voted to the donors.

Mr. J. W. Douglas exhibited a living specimen of *Cerambyx Heros* bred from a log of wood imported from Bosnia; also a young larva of the same species from the same source.

Prof. Westwood exhibited a number of cases constructed by the larva of some species of *Phryganea* inhabiting Southern Europe. They were composed of small semi-transparent quartz-like particles, and had been described by Swainson in 1840 as a shell belonging to the genus *Thelidomus*, div. *Turbineæ*.

Prof. Westwood also exhibited a specimen of a plant-bug (*Capsidæ*) which had been sent to him by Mr. Alexander Wallace, together with the leaf of an orchis (*Cattleya Aclande*), from Bahia. The leaf was covered all over with blisters caused by the attacks of the insect.

Mr. Jenner Weir exhibited a female specimen of *Cicada montana*, taken in his presence in the New Forest by Mr. Henry Auld, who stated that he was attracted to the spot where the insect was concealed by hearing it stridulate.

Mr. J. W. Douglas suggested that possibly the specimen caught did not give rise to the sound heard, but that it was produced by a male concealed near.

Mr. Weir remarked that he had searched for the stridulating organ in the specimen exhibited, and had found traces, although developed but slightly in comparison with those of the male.

Mr. S. Stevens exhibited two living specimens of *Tillus unifasciatus*, taken near Norwood. They fly rapidly in the sunshine, and settle on oak-palings.

Mr. J. P. Mansell Weale read notes "On Variations in Rhopalocerous forms inhabiting South Africa." The author, after stating that he had travelled over most of the eastern districts of the Cape Colony, alluded to the distribution of plants as affecting that of insects, and noticed the apparent encroachments of the subtropical flora and insect fauna along the south-eastern seaboard, the absence of any great barriers and the general uniformity tending to produce close variations. He exhibited and remarked on a large series of *Papilio merope,* male and female, some reared by him, and all collected in one small wooded gully, isolated in an open grass country. He also exhibited male and female *Nymphales xiphares* (*Thyestes*), the male of which is wanting in the National Collection, remarking on the apparent imitation by the female of *Amauris Echeria.* He next exhibited and remarked on a series of imagines of *Aeræa Esetria,* some of the forms of which are separated by some entomologists, and stated that all the forms had been reared from larvæ collected on a single plant. He next exhibited a series of *Innonia Pelasgis* and *Archesia,* showing a very close gradation linking the two forms, and showed that some of the latter approached *I. Amestris,* although the alliance was not so evident as in *I. Pelasgis.* He objected to the use of the name "species" as too freely used among plants and insects, and suggested that it merely implied a provisionally uncertain distinction of apparently important differences. In illustration of this, he exhibited specimens of *Callosune Evarne* and *Keiskamma,* two forms hitherto held distinct, but of which the ova, larvæ and pupæ exhibited no differences, although in two broods in successive years the forms appeared separately. He also remarked on artificially produced changes in the pupæ.

Prof. Westwood stated that he had just received collections of Coleoptera and Lepidoptera from South Africa, collected by Mr. Oates.

The Secretary read a letter from Mr. W. G. Gibson, of Dumfries, stating that *Colias Edusa* had made its appearance in that district during the month of June, and suggesting that its occurrence might be accounted for by the large importation of foreign clover.

Prof. Westwood stated that Mr. Alexander Wallace had informed him that both *Colias Edusa* and *Hyale* were very common about Colchester in June.

Prof. Westwood brought under the Society's notice the recent accounts of the appearance of the Colorado beetle in Ontario and near Cologne.

Mr. May handed in a copy of the Memorandum issued by the Canadian Minister of Agriculture in relation to this insect.

Part II. of the 'Transactions' for 1877 was on the table.—R. MELDOLA, *Hon. Sec.*

NOTICES OF NEW BOOKS.

The Birds of South Africa. By E. L. Layard, F.Z.S., &c. A New Edition, thoroughly revised and augmented by R. B. Sharpe, F.L.S., F.Z.S. Royal 8vo. Parts I.—IV. London: Quaritch. 1877.

The best way of reviewing a new edition is obviously to compare it with the original. In the present case, however, this would scarcely be fair, for a glance only is needed to show that the editor has nearly doubled the size of the work by extending the boundaries of the region treated of, from the twenty-eighth parallel of latitude (the limit originally fixed by the author) to the Zambesi on the east coast, and the Quanza on the west coast of Africa. It should be remembered also that when Mr. Layard wrote his book, in 1867, he did so under great disadvantages. Far removed from European libraries and collections, he was prevented from making many references and comparisons that were most desirable, and in many cases he had to rely upon naturalists at home for the identification of the rarer and more obscure species. In view of these difficulties, the wonder is that his shortcomings have proved to be so few. It may be truly said that, with the exception perhaps of Jerdon's 'Birds of India,' no work has done more for the Ornithology of a country than this of Mr. Layard's, and no greater proof of its utility can be found than the large increase in the number of workers who have commenced original researches in Ornithology since it appeared.

In preparing this new edition, it is evident that Mr. Sharpe has bestowed upon it considerable time and trouble. Not content with revising the text so as to bring it to a level with the knowledge of the present day, he has carefully gone through all the works bearing on the subject published prior to the first edition, and has reproduced the excellent notes by Mr. Ayres on the birds of Natal which Mr. Layard for want of space was compelled to omit.

Especial pains seem to have been taken with the geographical distribution, the range of the various birds being carefully traced throughout the different districts of South Africa.

Some reviewers, we observe, have found fault with the omission of the characters of the families and genera which were given in the original work; but these were avowedly compiled, and not always accurate, and the space previously occupied by these paragraphs is now filled by a vast amount of original matter which is much more to the purpose.

Some idea of the way in which the scope of the book has been extended may be gathered from the fact that in the four parts already issued 322 species occupy 336 pages royal octavo, while in the original work the same number of species occupied only 163 pages demy octavo.

Ten species of Raptorial birds not found in the old edition are included in the new, and a proportionate increase in other orders is apparent as the work progresses.

The following are described as new for the first time:—*Caprimulgus fervidus* (page 86), *Andropadus hypoxanthus* (p. 205), *Crateropus Kirkii* (p. 213), *Æthocichla*, a new genus with the type *Æ. gymnogenys*, Hartlaub (p. 215), *Neocichla*, a new genus with the type *N. gutturalis*, Bocage (p. 215), *Pinarornis plumosus* (p. 230), *Saxicola Layardi* (p. 236), *Saxicola Shelleyi* (p. 246), *Saxicola Andersoni* (p. 249), *Drymœca hypoxantha* (p. 260), *Acrocephalus fulvolateralis* (p. 288), and *Zosterops atmori* (p. 326).

The coloured plates in this edition add considerably to the attractiveness and utility of the work. Four parts are already issued; we presume as many more will be necessary to complete it.

Naturgeschichte der Vögel Europa's, von Dr. Anton Fritsch, Custos der zoologischen Abtheilung am Museum des Königreiches Bohmen. 1 vol. 8vo, pp. 506 and Index, and Atlas, folio, 64 plates. Prague: F. Tempsky. London: Trübner and Co.

Although this is not a recently published work, having been issued in parts at Prague and completed in 1871, it is only recently that arrangements have been made for its publication in London, and as it is very little known in this country, certainly not so much as it deserves to be, we think it right to direct attention to it. Dr. Fritsch's 'Birds of Europe' is chiefly remarkable for the beautiful atlas of plates which accompanies the letterpress, wherein all the birds mentioned in the text are coloured with a softness and fidelity to nature which at once commends them to the critical eye of the ornithologist. The figures are rather small, perhaps, but they convey an accurate idea of form and colour, if not always of relative size; and the possessor of any European bird-skin could not fail to identify the species from the plates, even if he had not the letterpress to assist him. In addition to the scientific names and synonyms, the name of each species is given in German and French, followed by a description of the species and a brief account of haunts and habits.

We are not sure about the cost of the work in England, but Messrs. Trübner & Co., who are the agents for the sale in this country, can supply information on this point, and will no doubt be glad to show a copy to any one desirous of inspecting it.

The Zoological Record; being Vol. XII. of the 'Record of Zoological Literature.' Edited by E. C. Rye, F.Z.S., M.E.S., &c. 8vo, pp. 592. 1877. London: Van Voorst.

The aim and scope of this useful annual cannot be too widely made known. To those who are unacquainted with its nature it may be described as a book of reference for working zoologists, containing, in the shape of an annual volume, a complete index to the zoological literature of the year preceding that of its publication. No matter what branch of Zoology the reader may be interested in, he has only to turn to the proper page to ascertain all that has been written on that particular subject during the previous year, including notices not only of separate volumes, but even of essays and articles from every zoological journal of note.

Nor is it a mere index; for short abstracts of the more important publications are given, and the general scope of each article is indicated. To working zoologists the 'Record' is especially useful, as facilitating research and directing attention to recently published works and essays, both English and foreign, which bear upon the particular subject they may have in hand. The volume closes with an index to the new genera and subgenera which have been described in the course of the year.